Bataglion, G.A.; Zuchetto, A.T.; Nasser, J.P. y Schmitt, B.D. (2018) Desarrollo de habilidades acuáticas en un niño con deficiencia visual e intelectual / Development of Aquatic Skills in a Child with Visual and Intellectual Disability. Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte vol. 18 (70) pp. 395-411
Http://cdeporte.rediris.es/revista/revista70/artdesarrollo921.htm
DOI: http://dx.doi.org/10.15366/rimcafd2018.70.012

ORIGINAL

DEVELOPMENT OF AQUATIC SKILLS IN A CHILD WITH VISUAL AND INTELLECTUAL DISABILITY

DESARROLLO DE HABILIDADES ACUÁTICAS EN UN NIÑO CON DEFICIENCIA VISUAL E INTELECTUAL

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Código UNESCO / UNESCO code: 5899 Otras especialidades pedagógicas: Educación Física Adaptada / 5899 Other pedagogical specialties: Adapted Physical Education.
Clasificación Consejo de Europa / Council of Europe classification: 17. Otras: Actividad Física Adaptada / 17. Other: Adapted Physical Activities.

Recibido 23 de mayo de 2016 **Received** May 23, 2016
Aceptado 5 de febrero de 2017 **Accepted** February 5, 2017

ABSTRACT

The purpose of this descriptive case study was to analyze the development of aquatic skills of a child with total visual and severe intellectual disability. Therefore, this child, seven years old, participates in a program of water activities, with individualized service for 12 sessions. The assessment matrix of aquatic skills, Winnick (2010), was used as a tool for data collection. The student showed positive performances in three categories: entering and coming out of the water and in the water orientation. The understanding of the entry is emphasized and exit through the adapted ramp; controlling the performance of lateral bearing and frontal diving; and, improvement on the 14 skills in the category of water orientation. The water activities allowed the student to overcome difficulties by making a qualitative improvement in the performance of certain skills.

KEY WORDS: disabled children; vision disorders; intellectual disability; swimming.

RESUMEN

El objetivo de este estudio de caso fue analizar el desarrollo de las habilidades acuáticas de un niño con deficiencia visual total e intelectual severa. Para esto, este niño, de siete años de edad, participó en un programa de actividades acuáticas, con atención individualizado, durante 12 sesiones. La matriz de evaluación de las habilidades acuáticas de Winnick (2010) fue utilizada como instrumento para recolectar datos. El análisis de los datos sucedió de forma descriptiva. El alumno presentó desempeño positivo en tres categorías: Entradas, salidas y orientación en el agua. Se destaca la comprensión de la entrada y de la salida por la rampa adaptada; el dominio en la realización del giro lateral y del zambullida frontal; y, la mejoría en las 14 habilidades de la categoría orientación en el agua. Las actividades acuáticas le permitieron al alumno superar sus dificultades dando un salto cualitativo en la ejecución de determinadas habilidades.

PALABRAS CLAVE: niños con discapacidad; trastornos de la visión; discapacidad intelectual; natación.

INTRODUCTION

In recent years, increasingly, children with disabilities have been encouraged to participate in motor activity programs around the world. Thus, swimming is one of the most traditional sports modalities for the disabled population (Araujo & Souza, 2009; Rodrigues & Lima, 2014). However, individual characteristics and needs of such children still present a great challenge to the Physical Education professionals who are always developing teaching and assessment strategies that contribute to the child's overall development to respect distinct possibilities (Rodrigues & Lima, 2014).

Therefore, aquatic activities may enable their practitioners an adequate function of the body systems, which are of great importance in the production of movement. Also, they will help them to achieve social adjustment, stimulate their creativity, self-expression freedom, ability to connect, interact and understand the world around them (Zuchetto; França & Nasser, 2011). Moreno-Murcia et al., (2016) also advocate the importance of aquatic activities by pointing out their benefits to the various aspects of child development. Besides, they indicate that experiences in the aquatic environment positively influence personality, self-confidence, autonomy and personal independence. Nevertheless, teaching activities, materials and styles have to be adapted to the persons' needs and abilities (Zuchetto, 2008). Such adaptations have an extreme connection with the disability type and its characteristics.

Thereby, intellectual disability is an incapacity defined by significant limitations, both in intellectual functioning and adaptive behavior. Then, it composes of conceptual, social and practical skills, and manifests before the age of 18 years (American Association on Mental Retardation – AAMR, 2006). The classification levels (mild, moderate, severe and profound) are defined according to the adaptive functioning. Intellectual disability characterizes, mainly, by deficits in generic mental capacities such as reasoning, problem-solving, planning, abstract thinking, judgment, and learning. Therefore, it results in impairments of daily life aspects such as personal independence and social integration, according to the DSM-5 (American Psychiatric Association – APA, 2016).

Visual impairment, in turn, is a permanent change in the eyes or conduction pathways of the visual impulse that can be characterized as partial (low vision) or total (blindness) (Resnikoff et al., 2004; OMS, 2010). Blindness is defined as the visual acuity of less than 1/50 or visual field loss corresponding to less than 10 degrees in the best eye and the best possible correction (Resnikoff et al., 2004). According to the International Classification of Diseases and Problems related to health (CID-10/H54-2) published by the World Health Organization (WHO, 2010), blindness is divided into profound (< 3/60 to > 1/60), almost total (< 1/50 with light perception) and total (without light perception).

People with visual impairment present characteristics such as delays in motor development, body image and balance, postural deviations, mannerisms, fear

and lack of independence (Winnick, 2010). The author suggests that the missing component for developing the normal patterns of movement and physical fitness of these people is the experience rather than capacity. Then, he stresses that physical activity programs have to promote such motor experiences, stimuli and motivation in the students. Santos, Passos and Rezende (2007) state that every child with visual impairment must participate in a unique stimulation program that favors his development process.

Depending on the context and experiences, the person with an intellectual disability may also improve through motor activities. According to the American Association on Mental Retardation (AAMR, 2006), the people with intellectual disabilities should receive special supports to improve their personal outcomes of independence, relationships, participation in society and personal well-being. It considers such supports as resources and strategies that aim to promote a person's development, education, interests, and well-being, and improve the individual functioning. The American Psychiatric Association - APA (2016) considers that the supporting level offered to these people can lead them to achieve an active participation in daily activities and improvements in adult life social engagement.

Thus, programs of water activities for people with disabilities can mean a moment of freedom and independence because they move freely and have the possibility of experiencing their potentialities and limitations, knowing and confronting themselves and breaking their personal barriers (Grasseli & Paula, 2002). According to the authors, from the moment they discover the ability to move in the water without any help, these people have pleasure in enjoying the water, increasing their self-esteem, self-confidence, and independence.

Based on the considerations mentioned above, the research objective was to analyze the aquatic abilities development of a child with total visual impairment and severe intellectual deficit, in a context of adapted motor activity.

METHODOLOGY

Research Characterization

The present research was carried out through a case study, with a descriptive-exploratory and qualitative approach of data according to Thomas and Nelson (2012), and was approved by the Ethics Committee on Research with Human Beings of a Brazilian Public University, under the process number 911/2010.

Study context

The research was developed at the Sports Center of a Public University of Southern Brazil, where the activities from an Adapted Motor Activity Program served as a context for the study. The program is linked to the university and develops motor activities adapted for children with physical, intellectual, visual

and auditory disabilities and autistic disorders. The activities take place twice a week, in the morning and afternoon. They work on the ground for an hour, and then, in the pool with the same duration (Zuchetto, 2008).

Participant characterization

The research participant was a seven-year-old child with a severe intellectual deficit, and total visual impairment originated in the neonatal period. The total visual deficiency was diagnosed shortly after birth due to retinopathy of prematurity, and the severe intellectual disability was diagnosed at six years of age. The clinical picture of the child characterizes him with multiple disabilities. It is worth noting that the child's guardians provided copies of medical reports/diagnoses.

The child participates in the Adapted Motor Activity Program since the age of three years and six months. Then, he has been involved in the program for the last four years.

From his birth to six years of age, he attended an early stimulation program for children with visual impairment, twice a week. It provided psychopedagogy, speech therapy, occupational therapy and guidance and mobility. During the same period, he attended a day care center, every day, from 1:00 to 6:00 pm. When he was seven years old, he stopped such activities and started attending a specialized institution for the care of people with intellectual disabilities during the morning, twice a week. Also, he started the regular education in a first-year class of elementary school, in the afternoon period.

Since he started the Adapted Motor Activity Program, the child showed peculiar characteristics that pointed to the need for developing this program of individualized activities. They were a lack of understanding regarding activities explanation, non-attendance of verbal instructions and aggressive attitudes in response to physical instructions for the tasks, as well as delays in language development (lack of speech), mannerisms and isolation about his disabled peers. However, he also showed pleasure and predisposition for experiences in the aquatic environment. It is worth mentioning that, in addition to participating in a program of individualized activities proposed in the research, the child continued to participate regularly in group activities in the Adapted Motor Activity Program.

Data collection instruments

The verification matrix of water skills proposed by Winnick (2010) was used as an instrument for data collection to evaluate the categories "water orientation," "frontal propulsion," "back propulsion," and also, "entrances" and "exits."

A camcorder was utilized for data recording. Also, it was chosen to make field notes because certain gestural and/or verbal behaviors, besides the realization

of some immersion movements, could not be observed later in the filming. Observations made in the activities' context, facts that call researcher's attention, regardless their degree of apparent relevance, are recorded as annotations and in a non-systematized form (Zuchetto, 2008).

Data collection procedures

The research was divided into the following steps: aquatic skills pre-assessment, aquatic activities program intervention and aquatic skills post-evaluation.

In the individualized care, the participant was instructed to perform the aquatic activities contained in Winnick's matrix (2010), which were developed in 12 sessions during two and a half weeks, excluding the weekends. The sessions had an average duration of 50 to 60 minutes and were divided into three parts: warming-up during approximately 10 minutes, 30 to 40 minutes of the main part and 5 to 10 minutes back to calm. It is worth highlighting that the first and last sessions were aimed at pre- and post-assessment skills. Two teachers, previously trained, accompanied the participant during the activities. One of them gave instructions and demonstrations, and the other supported the instructions, especially the physical ones.

Classes were previously planned and organized by following Winnick's skills matrix (2010). They were developed in a heated pool (29° to 32° C) equipped with ramp and access steps, a support bar and depth reducer platforms (1.20 x 1.00 x 0.45 meters). The activities were carried out over the entire pool length (12.5 x 17 x 1.20 meters), facilitating the environment exploration, favoring displacements, fluctuation, propulsion, and breathing. The materials used for the activities were diversified to stimulate the student, improve his engagement and facilitate displacements as suggested by Arroyo and Oliveira (2007). There were rubber toys, E.V.A. and/or plastic, sponges, balls with and without rattle, ropes, sinking materials, wall stickers, floating materials (carpets, buoys, tubes and connectors, dumbbells in different shapes, sizes, nuances, and materials).

All lessons were filmed and the recording period comprised the total session time, including pool entrances and exits. Afterward, the filming was entirely transcribed, and the verification matrix of Winnick's water skills (2010) was fulfilled. For each proposed aquatic activity, the participant received a score that consisted of the following codes: O (cannot do it), X (independent), V (does through verbal instructions), F (does with physical instructions). It is worth emphasizing that there was no evaluation of the categories "lateral propulsion" and "breaststroke," and all the matrix codes punctuation were not used because they do not correspond to the student' s possibilities and performance level.

Data analysis procedures

Data analysis happened according to Triviños (1996), and they passed through three distinct processes: collected material organization; analytical data description that refers to their codification, classification, and categorization, and finally, information interpretation and reflection performed in a descriptive way. Thus, by using the Windows Media Player program, the filming was initially transcribed by one of the study's members. Then, the matrix of aquatic abilities analysis was fulfilled according to Winnick (2010), and finally, it was possible to perform a descriptive analysis of the obtained data.

RESULTS

The study's results demonstrate the child's performance in the development of aquatic abilities that are subdivided into five categories: entries, exits, water orientation, frontal propulsion and back propulsion. From the interventions, the student presented positive results in the skills performance of three categories (Tables 1, 2 and 3).

Table 1. Student Performance in Category I - Entrances

I. Entries / Class	1	2	3	4	5	6	7	8	9	10	11	12
Entering by the ramp	V, F	V, F	V, F	V, F	V, F	V, F	V, F	V, F	V, F	V	V, F	V, F
Stomach slide in	V, F	V, F	V, F	O	O	O	O	O	O	O	O	O
Jump: shallow	O	O	O	O	O	O	O	O	O	O	O	O
Jump: deep	O	O	O	O	O	O	O	O	O	O	O	O
Dive: kneel	O	O	O	O	O	O	O	O	O	O	O	O
Dive: compact	O	O	O	O	O	O	O	O	O	O	O	O
Dive: stride	O	O	O	O	O	O	O	O	O	O	O	O
Dive: standing	V, F	V, F	V, F	V, F	V, F	V, F	O	V, F	V, F	O	V, F	V, F

Subtitles: O (cannot do it), V (verbal instructions), F (physical instructions) & X (independent).

Table 2. Student Performance in Category II - Exits

II. Exits / Class	1	2	3	4	5	6	7	8	9	10	11	12
Ramp exit	V, F	V, F	V, F	V, F	V, F	V, F	V, F	V, F	V, F	V, F	V, F	V, F
Pull-up – side of pool	O	O	O	O	O	O	O	O	O	O	O	O

Subtitles: O (cannot do it), V (verbal instructions), F (physical instructions) & X (independent).

Table 3. Student Performance in Category III - Water orientation

III. Water orientation / Class	1	2	3	4	5	6	7	8	9	10	11	12
Washes face	X	X	X	X	X	X	X	X	X	X	X	X
Puts chin in water	X	X	X	X	X	X	X	X	X	X	X	X
Puts mouth in water	X	X	X	X	X	X	X	X	X	X	X	X
Puts mouth and nose in water	X	X	X	X	X	X	X	X	X	X	X	X
Puts face in water	X	X	X	X	X	X	X	X	X	X	X	X
Puts whole body in wáter	X	X	X	X	X	X	X	X	X	X	X	X
Blows bubbles	X	X	X	X	X	X	X	X	X	X	X	X
Blows bubbles with face in water	X	X	X	X	X	X	X	X	X	X	X	X
Blows bubbles lying on front with face in water	V, F	V, F	V, F	V, F	V, F	X	V, F	X	X	X	X	X
Blows bubbles with full body underwater	V, F	V, F	V, F	V, F	V, F	X	V, F	X	X	X	X	X
Bobs 5 times in shallow water	F	F	F	X	X	X	X	X	X	X	X	X
Bobs 10 times in shallow water	F	F	F	F	F	X	F	F	X	F	F	F
Bobs 5 times in deep water	F	F	F	F	F	F	F	F	F	F	F	F
Bobs 10 times in deep water	O	O	F	F	F	F	F	F	F	F	F	F

Subtitles: O (cannot do it), V (verbal instructions), F (physical instructions) & X (independent).

Category IV (frontal propulsion) encompasses the following skills: “pushes off side with face out of water”; “pushes off side with face in water”; “pushes off side with face in water and kicks”; “arm stroke while walking”; “arm stroke with underwater recovery – 1,50 m”; “arm stroke with underwater recovery, face in water – 1,50 m”; “arm stroke with underwater recovery, face in, kicking – 3,0 m”; “arm stroke with over-water recovery – 3,0 m”; “arm stroke with kick – 6,0 m”; “front crawl with rhythmic breathing to front – 6,0 m”; “front crawl with breathing to side – 6,0 m”. In spite of having performed the skills "pushes off side with face in water” and “give a kick” during the interventions, it was not possible to identify improvements in the child’s performance in that category. However, there was a progress in the activity "slide under the water in ventral decubitus.

Category V (back propulsion) suits the skills: “back float – 5 seconds”; “back glide off wall with a noodle”; “back glide – 3,0 m”; “back glide with kick – 6,0 m”; “back glide with finning or sculling – 3,0 m”; back crawl arms – on deck”; “back crawl arms over a noodle”; back crawl arms with kick – 6,0 m”. The student showed progress in the ability “back float – 5 seconds”. There were no improvements in the student’s performance in other skills of the category.

DISCUSSION

From Table 1 and referring to the category entries, it is noticed that the student presented modifications in the skills entering by the ramp, stomach slide in, and dive standing.

In relation to the skill “entering by the ramp”, it is assumed that although he developed the ability only with verbal instructions, only once (class 10) the student understood and/or learned the entrance way to the pool because during the classes, he began to collide less times on sides and rails of the access

ramp. Besides, in class 10, he carried out the whole entrance receiving only verbal instructions. Then, he moved along the access ramp developing some guidance skills in the water, he did not collide on the sides, and when reached the deep part of the ramp, he found the support bar without needing any physical instructions. Castro et al., (2004) justify the performance by saying that the individual with visual impairment develops compensatory strategies in the orientation system that allows a functional displacement.

The need for verbal instructions associated with physical ones, in turn, is justified by the student's autonomy at the place (access ramp), where he can develop his personal skills (guidance competencies in the water) without needing any help. It caused the student to ignore verbal instructions, which led him to need physical instructions in such ability, in almost every class.

Regarding the “stomach slide in” ability, it is possible to say that the student understood the skill and could develop it from verbal and physical instructions, although remained with his knees flexed and did not accept any help to correct the position. According to Nogueira, Carvalho and Pessanha (2007), lags in the development of psychomotor skills have consequences in the performance. In Table 1, it is observed that such ability was developed only in the first three classes. It happened because the skill was not proposed in some classes, and in others, the student could not or refused to do it.

The “dive standing” ability was developed independently in two classes (7 and 10). However, the student was not prepared to perform it alone because, during the exercise, he showed insecurity again and needed some help to accomplish the task quietly. Such behavior finds an academic support in Mazarini’s research (1992). It emphasizes that the diving stage offers greater difficulty to the visually impaired child since he throws himself into space without having the notion that visual perception transmits about height, which usually increases discomfort sensation in the fall. Then, fear stimulates physiological responses such as increased muscle tone, involuntary muscle movements’ increase, and inability to float (Winnick, 2010). In the other entrances skills, there were no changes in the student's performance since he could not perform them in any class.

According to Table 2, the student did not present any changes in the category “exits.” However, in the "ramp exit" skill, as well as the "entrance" ability, he began to recognize the environment in the course of classes by using the remaining senses, especially the touch sense. The constant need for verbal and physical instructions is explained by his resistance to leaving the pool. Such resistance was perceived when he encountered the support bars and/or when he touched the shallow end of the ramp with his feet because in such situations he attempted to return or remain on the spot developing guidance skills in the water. Therefore, he refused to comply with verbal instructions and, consequently, he required physical instructions on all exits. In some classes, he also rejected physical instructions and presented aggressive behaviors. About such behavior, Winnick (2010) points out that the children with intellectual

disabilities do not often fully understand what is expected of them, and they may respond inadequately for misinterpreting the situation and not because they do not have adequate reactions. Nevertheless, studies related to Folkins and Sime (1981) report that with the practice of physical activity there are improvements in the intellectual functioning, behavior, affection and personality of these children and this reflects in the aggressiveness decrease.

In the "pull-up – side of pool" skill there were no modifications because the student could not develop it due to the task complexity for his abilities and possibilities. Thus, it must be considered that vision plays a key role in motor development since it places the child in contact with external reality and provides stimuli that help in guiding and controlling his body action. Much of the child's experiences in the environment exploration, discovery of his body, contact with objects and his relation with others relates to a direct participation of the vision, which becomes a significant element in the organization of safe, conscious and voluntary motor action (Santos; Passos & Resende, 2007).

In Table 3, it is possible to see that the student presented positive results in all skills of “water orientation” category. Data show that the child had a good adaptation to the water environment at the beginning of the interventions. Since the first class, he independently developed the skills "washes face", "put chin in water", "put mouth in water" , "put mouth and nose in water," "put face in water," "put whole body in water," "blow bubbles" and "blow bubbles with face in water". For Lima and Almeida (2008), adaptation to the water environment is one of the most significant foundations in the teaching-learning process of aquatic abilities. For the visually impaired child, it is quite remarkable to experience proprioceptive experiences that are fundamental to the structuring of body awareness and motor control.

Stopka (2001) suggests that the use of materials is particularly vital in the instructing process of aquatic skills. For the research participant, the depth reduction platform, pool spaghetti, floating mats, and pool support bars were essential for his evolution in the skills "blowing bubbles lying on front with face in water" and "blowing bubbles with full body underwater". The use of materials and time available to make the child train his skills enabled the change about the need for verbal and physical aids to his independence in the accomplishment of such abilities. It is worth mentioning that in the last classes he stayed, for a few seconds, developing skills without needing any help, including materials, evidencing improvements, also, in the fluctuation. Winnick (2010) considers the use of support materials as flotation devices that ensure safety, reduce fear, support and help participants to maintain a level position in the water, and also, stabilize and facilitate the movement.

Besides the use of materials, verbal and, in particular, physical instructions were of paramount importance for improving the child's performance. Body contact was a primordial resource as a form of instruction and/or stimulation for the development of abilities since, most of the times, verbal instructions were not followed. Thus, physical instructions resulted in improvements in all water

orientation skills, especially regarding breathing. It was also noticed that teacher/student interaction through physical contacts to demonstrate the activities favored the tasks understanding. In the activity carried out during classes to work the breathing, for example, it was evidenced that after observing the breathing mechanism with the face and hands next to the teacher's nose and mouth, the student started breathing with more quality after each class. Lima (2003) confirms, in his study, that affectivity helps to control better the child's balance, leading him to breathe and float more adequately. According to Borges, Galindo and Villodre (2008), breathing work is understood as the knowledge of respiratory functions and adaptation to the aquatic environment. Their learning and mastery are essential for aquatic skills autonomy. The student's performance confirms what the authors said because the understanding and correct execution of the respiratory mechanism was his main evolution, in the period of interventions. Besides contributing to the fluctuation, it resulted in the skills' improvement to "sink", "exhale" and "swim up", which were carried out with autonomy.

In the ability "bobs 5 times in shallow water" the student went from the need for verbal and physical instructions to the performance independence by using the depth reduction platform. In the skill " bobs 10 times in shallow water" by also using depth reduction platform, he did not require physical instructions in only two classes (6 and 9). However, from class seven the physical instructions had the function of stimulating the complete task accomplishment. Regarding the skills "bobs in deep water" physical instructions were used until the end of interventions due to the little student's independence, in that place. Therefore, he performed the ability five times with physical instructions in all classes and evolved by carrying out the skill ten times with physical instructions from the third class onwards. It is worth highlighting that in the first two classes the student was unable to complete the task until the end because he was tired when reaching the 8th repetition, approximately. Nevertheless, he developed the full ability at the end of the interventions demonstrating that he reached the respiratory domain, which in turn, is a prerequisite for such skill since the student cannot learn mechanical movements before mastering the respiratory mechanism (Pérez, 2006).

Another significant development regarding the orientation skills in the water was the apnea time that increased considerably during the lessons. The improvement was observed, mainly, during the activities' development in depth reduction platform and access ramp, where the student had autonomy in the accomplishment of some skills. Regarding the practice of diving, the student's favorite activity, it was possible to notice a significant evolution on apnea time at the beginning and the end of interventions. When the person increases the volume of air in the lungs and remains in inspiratory apnea, the immersed body volume increases as well as the amount of water displaced and, consequently, the hydrostatic impulsion force. Therefore, there is a change in the force on which the equilibrium depends, in the aquatic environment (Barbosa & Queirós, 2003).

In the frontal propulsion category, although the student carried out the skill “pushes off side with face in water” two times in class six, he did not present significant changes in this category because he remained unable to do the task or refused it, in that class and other classes.

It was noticed that the child’s difficulties in the abilities of frontal propulsion category were more related to the instructions understanding than the activities execution. For example, in the ability "pushes with face in water" he began to position himself correctly during the classes, remaining in a ventral decubitus position and his face in the water, developing the respiration mechanism properly, with his arms outstretched and hand to hand with the teacher, hip and knees flexed, and feet leaning against the side of the pool. However, he did not follow the instructions to give the push. Then, it is clear that problems of memory, attention, and understanding are usually the primary commitment of people with intellectual disabilities (Winnick, 2010). Lepore (1998) corroborates that these difficulties interfere with physical fitness development related to health and acquisition of motor skills.

In the skill regarding "give a kick" which was worked along with sliding activities to facilitate the understanding, he did not improve because the student refused to receive physical instructions (ankle support) in most classes, and he did not comply with verbal instructions to hit the water with his legs. On the other hand, the participant evolved in the activity slide with verbal and physical instructions (support in the hands). He corrected hip and knees position, which remained flexed at the beginning of the interventions, and presented the perfect alignment of the body in the last classes, when it was possible to notice his body fully extended while floating and receiving physical instructions to slide. Besides, by improving his respiratory control, he spent more time developing the skill. That happens because the respiratory domain is significant for performance since it avoids the excess of muscular contraction generated by the discomfort of water in the nostrils, which prevents the correct execution of movements (Mazarini, 1992).

Regarding other abilities of frontal propulsion category, there were no alterations in the student’s performance because he could not carry out them. Winnick (2010) considers that the first step to good propulsion is to get flotation or another form of support to keep the body in the most aligned and balanced position possible. Therefore, it can be said that the student has successfully reached the first step in frontal propulsion learning since the mastery of basic aquatic skills represents a starting point for new learning (Borges; Galindo & Villodre, 2008).

Regarding the category back propulsion, the participant presented some changes in one ability. The skill "back float - 5 seconds" was developed with verbal and physical instruction in five of twelve lessons. That happened because the student refused to stay in dorsal position to perform the activity, in some classes. In the classes he carried out the ability (3, 4, 5, 6, and 8), he needed trunk support to float, in his legs to correct knees position that remained

flexed, and his head to prevent water from entering his nose and causing irritation. It is worth noting that, at various times, he refused to receive physical instructions on his legs, preferring to keep the knees flexed while receiving chest support for flotation. Besides, he declined to receive support in the ankles to hit legs, in all classes.

Such results differ from some items that Mazarini (1992) cites as the most common failures presented by visually impaired children, at the beginning of back propulsion learning. They are excessive global muscle tension with marked contraction of hips and lower back, resulting in flotation loss; lack of motion range, which leads the child to an incomplete work; legs do not perform ascending and descending movements; exaggerated flexion of legs causing the knees to come out of water and incorrect feet position: dorsiflexion instead of extension. In Thus, Lepore (1998) emphasizes that individuals with visual impairment should perform activities to improve their general physical fitness, movement fluidity (to face the tendency for rigid posture and mobility), posture (shoulders and head aligned with the trunk), mobility, orientation, independence, body image, spatial awareness and sound localization.

It was noted that the student often took the initiative to develop the ability "back floating," and it had a relaxing function. Campion (2000) confirms such fact by referring to aquatic activities as a highly efficient means of discharging psychological stresses due to the relaxation power of water. According to the author, the benefits in the psychological aspect will also result in improvements in the mood and motivation of people with disabilities.

The student could not and/or refused to develop other abilities of the back propulsion category, which is considered as the most difficult among the skills worked. Castro et al., (2001) also showed in their research that individuals' performance with intellectual disability is directly compromised by the task complexity.

CONCLUSIONS

Among all the skills worked, it was possible to observe that in the category "water orientation" the student presented the most positive results. The good adaptation of the student to the water environment from the beginning of the interventions favored his learning and evolution in the performance of such abilities. It is worth highlighting the respiratory dominance as another factor of extreme influence on all skills learned and improved. Such improvement avoided the rapid fatigue and allowed the student to stay longer in the activities throughout the classes.

It was possible to observe, during the interventions, that proximity and physical instructions were necessary to make possible the stimulation of remaining senses, in this case, tact, which was the most used resource for instructions/demonstrations. That is because the touch was perceived as the

most developed and/or used by the student of all senses that remain. Therefore, the physical and affective contact between teacher and student was essential for aquatic skills' progress. The use of materials was also an essential means to minimize difficulties resulting from lack of vision and understanding. By using them associated with physical instructions, the child gained more confidence and became more independent in the aquatic environment.

It is noteworthy that the lack of responses to verbal instructions was a limiting factor of the study since such behavior prevented the teacher from verifying how much the student understood about verbal instructions of skills. Thus, it was difficult to plan and apply classes that were modified according to the student's behavior and feedback regarding proposals and instructions. Moreover, the short period of interventions limited the child's performance evolution because he needs more time to learn when compared to his non-disabled peers.

It is worth mentioning that, in general, the student's difficulties were more related to the proposals understanding than the abilities' achievement, which is inherent to the intellectual disability. It mainly interfered in the categories' abilities of "frontal propulsion" and "back propulsion," in which he could not understand and learn the pushing movement. The conclusion is that due to the numerous benefits they provide, the aquatic activities allowed the student to overcome his difficulties by making a qualitative leap in the development of aquatic abilities, and also, acquiring independence in particular skills.

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